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1.9 Reserve  
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Brush Control

# TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION  
U.S. DEPARTMENT OF AGRICULTURE · · FOREST SERVICE

No. 502

Aerial Spraying of Upland Brush Before Planting  
Effectively Reduces Need for Plantation Release

With most of the easy planting sites in the Lake States already in forest plantations, land managers are faced more and more frequently with the difficult problem of restoring conifers to land now occupied by brush or by broad-leaf trees of poor quality. The most recent estimates indicate that there are about 7,650,000 acres of plantable commercial forest land in the region, and most of it falls in the brush category. Plantations put in on such land not only cost more initially than those on open land but also require considerable outlays later on to free the trees from brush competition. Both the cost of planting and the number of release jobs, however, can be reduced by special treatment of the site to kill back the brush the season before the area is planted.

Going over the site thoroughly with a heavy disk pulled by a 40- to 60-horsepower tractor in late June to early August has proven very effective, reducing the release job to 1 or 2 operations where otherwise 3 or 4 would be required. Disking, however, is slow work. Moreover, it costs \$15 to \$20 per acre and cannot be used on lowland or on rocky or steep upland sites.

In an attempt to speed up the preparation of extensive sites for planting and to lower the cost, foliage spraying with herbicides, applied at first with ground equipment and later from aircraft, has been used. This method, particularly aerial spraying, has proven an acceptable substitute for disking. Not only does it cost considerably less per acre but also it can be done far more rapidly and, equally important, with generally excellent results.

A typical example of aerial planting-site preparation is furnished by a 20-acre tract of brushy upland near Babbitt, Minn., on which it was planned to establish red pine and white spruce. This area had been logged for jack pine about 1945 and then planted to the same species, only to have the plantation destroyed by deer. At the time of spraying in late July 1954, the area was covered with a dense growth 4 to 6 feet tall of hazel, willow, green alder, mountain maple, and dogwood. The herbicide used was a 50-50 mixture of the low volatile esters of 2,4-D and 2,4,5-T applied at the rate of 2 pounds of acid in 4 gallons of oil-water emulsion per acre. In early May 1955, the entire tract and two strips in the adjoining unsprayed brush were planted to 1-2 red pine and 2-2 white spruce. Because of the excellent top kill, the planters were able to set trees in the middle of brush patches that otherwise could not have been planted.

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July 1957

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EUGENE I. ROE, Forester  
Lake States Forest Experiment Station  
AUGUST E. BLOCK, District Ranger  
Superior National Forest

Naturally there has been some resprouting, but the new vegetation is not offering as much competition as was expected. An examination made by the Station and the Superior National Forest in October 1956 after 2 growing seasons shows that so few of the planted trees need release that this operation can be delayed for at least another year. Only 13 percent of the red pine and 25 percent of the white spruce are overtopped on the sprayed portion of the plantation, compared to 75 and 62 percent respectively on the unsprayed area. Furthermore, the white spruce averages almost 3 inches taller in the sprayed area.

Considering that the ground preparation job here cost only about \$6 per acre and that the plantation can be brought through with no more than one subsequent release, it would appear that aerial spraying is fully as effective a method of site preparation as disking and much less costly. Considerable expansion in its use for preparing large areas of upland sites for planting therefore seems warranted.